

inches, on board the Canadian S. S. *City of Victoria*, in 51° 40' N., 167° 54' W., both on the 6th. The lowest pressure reported by a land station in the Gulf of Alaska during this period was 28.74 inches, at Kodiak, p. m. of the 4th.

The most intense manifestation of the Aleutian Low was that which began on the 10th and extended far to the southward on the 11th and 12th. On the 12th, hurricane wind velocities and extraordinarily low pressures developed, centering very nearly about latitude 50° N., longitude 149° W., and extending for several degrees in all directions. The point given was the scene of lowest barometer, 27.89 inches (uncorrected), read on board the American S. S. *City of Spokane*, Manila toward Seattle. Said the observer, Mr. G. van Haute:

From 29.07, noon on 11th, barometer fell rapidly with wind increasing from easterly, until 3 a. m. 12th, barometer was 27.89, wind ESE., force 10. During the gale wind shifted continuously between NE. and SSE., tremendous sea running.

The pressure read from the barometer of the Japanese S. S. *Ayaha Maru*, about 30 miles to the westward of the *City of Spokane's* position, was 27.91 (corrected), at 2:30 a. m. of the 12th, during a southeast hurricane. Later in the day the wind shifted to southwest, still blowing with hurricane force, but soon moderating.

During the 12th the American S. S. *Buford*, Capt. C. Noren, bound from San Francisco toward Nome, was in latitude 52° 40' N., longitude 149° W. The observer, Mr. C. F. May, made the following note:

From 4 a. m. to 6 a. m. barometer lowest at 28.45 (corrected); SE. hurricane. Vessel hove to from 6:05 to 9:50 a. m. Helm would not answer. Hove to again until 10:52 a. m.; 8 a. m. barometer started to rise; wind SE. 9; sea phenomenal. At 12 noon barometer 28.83 and still rising; wind SE. 6; high rollers with steep front.

In 51° 38' N., 145° W., the American S. S. *Dewey*, westward bound, encountered a whole gale from the south-southeast during the morning hours, lowest pressure 28.74 inches. The American S. S. *West Jessup*, at 1 a. m. of the 12th, while in 51° 51' N., 145° 17' W., experienced a southeasterly gale, force 10, lowest pressure 28.57 inches.

On October 15 at 8 p. m. a storm center appeared near 50° N., 135° W., and entered the Washington coast during the night. The Japanese S. S. *Ayaha Maru*, at 8 p. m. of the 15th experienced a northwesterly gale, force 9, in 48° 52' N., 133° 50' W., with an accompanied pressure as low as 28.61 inches. The Weather Bureau station at Tatoosh Island recorded a maximum velocity of 65 miles from the southwest, lowest pressure 28.97 inches, during the early morning of the 16th. This station during the entire month had 10 days with wind velocities equalling or exceeding 40 miles an hour.

Under date of October 22, the San Francisco (Calif.) Examiner reported the arrival in port of the Japanese freighter *Atlas Maru*, after an 8-day battle with storm winds which began when the vessel was about 2,000 miles from San Francisco. This item alone bespeaks the turbulent conditions which prevailed over the northeastern Pacific during that period.

On the 23d the American S. S. *President Madison* experienced a gale the maximum force of which was 10 from the west, in 50° 05' N., 179° 05' W., lowest pressure 29.38.

At this time the energy of the Aleutian Low was shifting into east longitudes, and thenceforth to the end of the month only moderate gales occurred to the eastward

of the 180th meridian. At the close of the month high pressure covered the greater part of the ocean in middle latitudes, and low pressure was central over western Alaska and Bering Sea.

In tropical latitudes of the eastern Pacific gales were reported upon several occasions, some associated with low and some with high pressure. On the 5th and 6th, while a shallow Low occupied the region of western Mexico and adjacent waters, the French S. S. *Texas*, southward bound, ran into a northeasterly gale, force 9, lowest pressure 29.62, in 19° 14' N., 105° 20' W. On the morning of the 6th the wind changed to south-southwest and diminished. The American S. S. *Cecil County*, in 17° 37' N., 104° 05' W., on the 5th, experienced an easterly gale, force 9, with accompanying rough, confused seas.

From the 11th to the 16th gales occurred off Champerico and in neighboring waters, a south wind, force 7, being reported as far south as 11° 19' N., 90° 20' W., pressure 29.82 inches, on the 16th. The highest force observed during the period was 9 from the west-northwest, lowest pressure 29.74 inches, noted by the American S. S. *Corinto* while in port at Champerico, on the 16th. On the 16th and 17th a southwest gale, force 8, was experienced by the American S. S. *E. L. Doheny III*, while off Bone Island, Panama. The same vessel on the 21st ran into a strong northerly gale, force 9, in the Gulf of Tehautepec.

There seems to have been less fog over the ocean than during September. However, it was observed on 13 days over that portion of the sailing routes in east longitude, extending between the 40th and 50th parallels, and the 160th and 180th meridians. Fog was reported for 6 days outside of San Francisco Harbor, and on 4 days near 50° N., 140° W., thence southeastward to the coast.

NOTE.

The American S. S. *Levant Arrow*, Capt. P. Muller, Observer Robert Brodel, Panama toward San Francisco, reported the following:

Waterspout October 16, 9 a. m., latitude 17° 35' N., longitude 103° 15' W. Sighted on our beam N. 26 E., 4 miles off, a whirl of water; and about 2 minutes later a small waterspout began to descend very rapidly from a cumulo-nimbus cloud. While descending to a visible contact with the whirl, it grew to a huge waterspout traveling slowly with the cloud eastward, having a 5° incline and dragging the base along until it disappeared on our quarter. Wind at the time west, force 3, pressure 29.82. Weather clear. Over the coast heavy clouds forming.

CYCLONIC DISTURBANCES IN THE SOUTH PACIFIC OCEAN.

By ALBERT J. McCURDY, JR.

Weather reports received from vessels that were in the South Pacific Ocean in October, 1923, indicate that stormy conditions prevailed off the southern coast of Chile and in the vicinity of Raratonga at the beginning of the month.

The British S. S. *Corinthic*, Capt. Frank Hart, Wellington toward Montevideo, reports high seas and squally weather experienced in latitude 53° 33' S., longitude 93° 59' W., on October 2. Fifth Officer F. G. Rogers states that the lowest barometric reading observed was 29.11 inches (corrected), at 8 a. m., wind NW. by N., force 7; shifts N. by W., NW. by N., and NW. backing gradually to W.

On the same date the British S. S. *Comeric*, Capt. E. N. K. Blackmore, Chief Officer G. A. Fellowes, Calcutta toward Talcahuano, Chile, experienced very rough seas, barometer 29.28 inches (uncorrected), wind SW., force 8, in latitude 39° 17' S., longitude 76° 55' W.

On the 4th of October a whole gale was encountered by the Panaman S. S. *Isonomia*, Capt. G. Marcussen, Grays Harbor toward Sydney, Australia. Second Officer E. Biet reports that the vessel experienced high and very rough seas. The lowest pressure, 30.12 (uncorrected), was observed at 1 p. m., on the 4th, in latitude 31° 07' S., longitude 157° 15' E., wind SW., force 8. Gale ended on the 5th, wind SW. Highest force of wind 9.

SIX OR SEVEN TYPHOONS IN THE FAR EAST DURING SEPTEMBER, 1923.

By Rev. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

It is much to our regret that weather telegrams from Japan, and consequently from the Bonin and the Loochoo Islands, have been missing since the disastrous Tokio earthquake of September 1. Hence, the existence of one of the typhoons of this month is given as doubtful and parts of the tracks of other Pacific typhoons can not be given as accurately as in the previous months.

Pacific typhoon of September 2 to 12.—Lack of observations from the Bonins and the Loochoos makes the track of this typhoon not altogether certain. If the typhoon followed the track as it is deduced from our incomplete daily weather maps, we must consider such a track as very peculiar and most abnormal. The typhoon appeared on the 2nd to the ENE. of Guam, in about 148° longitude E. and near 15° latitude N. It moved northwestward until the 5th, then due west on the 5th and the 6th in about 22° latitude N.; on the 7th, when near 130° longitude E., it recurved sharply to SE. and S., keeping practically this southerly direction on the 18th; finally on the 9th and 10th it inclined again westward between 17° and 19° latitude N., at the same time decreasing in intensity. On the 11th it was only a low-pressure area covering the northern part of Luzon.

Japan's typhoon, September 15.—This typhoon was shown in our weather maps of the 7th to 9th in the neighborhood of the northern Ladrone Islands not far from 147° longitude E. and 19° latitude N. It recurved to Japan between the Loochoos and the Bonins and reached the southern coast of Japan to the SE. of Kobe on the 15th, moving probably to NE., although it was inclining still more to the E. We are able to follow this part of the track from observations made on board the steamer *Steel Navigator* to the east and south of the track, and on board the steamers *President McKinley* and *President Wilson* to the north and west of same. The latter two steamers were anchored at Kobe. The lowest barometric readings observed in these steamers, although situated about 100 miles from the center, were as follows:

Steamers.	Position.	Barometric minimum. ¹	Winds.
Steel Navigator	31° 15' lat. N., 137° 12' long. E.	28.93 ins., 734.81 mm.	Veering from ESE. to SSW.
President McKinley	At Kobe.....	28.97 ins., 735.84 mm.	Backing from NE. to W.
President Wilson.do.....	29.01 ins., 736.85 mm.	Backing from ENE. to WNW.

¹ Not corrected for gravity.

Formosa Channel typhoon, September 12 to 14.—The track of this typhoon was very peculiar and abnormal. The center appeared for the first time in our weather maps of the 11th over the Eastern Sea NE. of Formosa. As we have no observations from Japan and the Loochoos, it is impossible to ascertain whether the disturbance formed over the Eastern Sea or had come from further east. On the 12th we could notice that the typhoon was moving WSW. or SW.; and on the 13th there could be no doubt that it was really moving SSW. through the Formosa Channel close to the western coast of Formosa. In the early morning of the 15th the center was west of Balintang Channel near 118° longitude E. and 20° latitude N. There was practically no trace of the disturbance after the 15th.

Pacific typhoon, September 14 and 15.—Observations taken on board the steamer *Salina* have made it possible to mention the existence and approximate track of this typhoon. It was moving NW. or NNW. on the 14th and recurved northeastward on the 15th near 151° longitude E. and 28° latitude N. The steamer *Salina* had its barometric minimum 29.48 inches (749.03 mm.), not corrected for gravity, at 4 p. m. of the 14th, when in 149° 20' longitude E. and 24° 35' latitude N., with a strong gale from NNW., high seas and heavy rain squalls. While the barometer was rising on the 15th, the winds backed from NW. to W.

Two simultaneous depressions or typhoons, NE. and W. of Luzon at the end of September.—It is only approximately that we can give the tracks of these two disturbances. The one of the Pacific moved very slowly NW. and N. about 200 miles east of northern Luzon on the 21st to 24th or 26th; then it seems to have inclined west toward the Batanes Islands, and finally recurved northeastward and filled up to the east of southern Formosa on October 1. The other depression or typhoon of the China Sea appeared on the 21st and 22nd about 100 miles west of central Luzon and moved very slowly westward, until it probably filled up on the 28th near or over the Paracels.

Besides the above mentioned typhoons of this month, the observations of Yap and Guam showed another center of typhoon on the 20th to 22nd moving probably westward from the northern part of the Ladrone Islands. It is impossible with the data at hand to decide whether the typhoon filled up in the Pacific or went on recurving toward Japan.

Observations from Formosa and Basco (Batanes Islands) seem to show another atmospheric disturbance to the east of southern Formosa and south of the Loochoos on September 12th to 14th, but we have no means at present to ascertain its existence and track.